

REMARKS

Claims 1 through 22 are currently pending in the application.

This amendment is in response to the Office Action of July 23, 2004.

Information Disclosure Statement(s)

Applicants note the filing of an Information Disclosure Statement herein on July 7, 2003, and note that although a copy of the PTO-1449 was returned with the outstanding Office Action, the foreign and other documents listed on page 1 were not initialed and therefore did not appear to have been considered by the Examiner. Applicants respectfully request that *all* information cited on the PTO-1449 (which is the same as that of record to that date in the parent application hereto) be made of record herein.

Preliminary Amendment

Applicants note the filing of a Preliminary Amendment on December 1, 2003, which filing was not acknowledged in the outstanding Office Action. Should the Preliminary Amendment have failed to have been entered in the Office file, Applicants will provide a true copy to the Examiner.

35 U.S.C. § 103(a) Obviousness Rejections

Obviousness Rejection Based on Tsang et al. (U.S. Patent 5,353,246) in View of Huang et al. (U.S. Patent 5,635,423) and Iranmanesh (U.S. Patent 5,514,900).

Claims 1 and 12 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Tsang et al. (U.S. Patent 5,353,246) in view of Huang et al. (U.S. Patent 5,635,423) and Iranmanesh (U.S. Patent 5,514,900). Applicants respectfully traverse this rejection, as hereinafter set forth.

Applicants assert that to establish a *prima facie* case of obviousness under 35 U.S.C. § 103 three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Third, the cited prior art reference must teach or suggest all of the claim limitations. Furthermore, the suggestion to make the claimed combination and the

reasonable expectation of success must both be found in the prior art, and not based on Applicants' disclosure.

The Applicants assert that the present claimed invention is not taught or suggested in the prior art. Applicants assert that a reference should be considered as a whole, and portions arguing against or teaching away from the claimed invention must be considered. Bausch & Lomb, Inc. v. BarnesHind/Hydrocurve, Inc., 230 USPQ 416 (Fed. Cir. 1986). The prior art references cited by the Examiner "would likely *discourage* the art worker from attempting the substitution suggested by [the applicant]." Gillette Co. v. S.C. Johnson & Son, Inc., 16 USPQ2d 1923 (Fed. Cir. 1990). The fact that the applicant achieved the claimed invention by doing what those skilled in the art had suggested should not be done is a fact strongly probative of nonobviousness. Kloster Speedsteel AB v. Crucible Inc., 230 USPQ 81 (Fed. Cir. 1986), on rehearing, 231 USPQ 160 (Fed. Cir. 1986). Additionally, "it is impermissible to use the claimed invention as an instruction manual or 'template' to piece together the teaching of the prior art so that the claimed invention is rendered obvious One cannot use hindsight reconstruction to pick and choose among isolated disclosures in the prior art to deprecate the claimed invention." In re Fritch, 23 U.S.P.Q.2d 1780 (Fed. Cir. 1992).

As stated above, the Applicants respectfully disagree with the proposed Office Action's view of the Tsang reference. The Tsang reference teaches or suggests a thin layer of titanium nitride is formed on a titanium silicide layer in a rapid thermal annealing step at 850°C. Both layers being formed over a polysilicon word lines used a portion of the structure. The present invention teaches away from this concept. The present invention was designed to overcome the limitations contained in the Tsang reference as it was noted in the specification that high temperature required for the deposition will initiate a silicidation reaction between platinum and silicon, thus consuming the platinum capacitor plate and contaminating the capacitor with silicon. It is, therefore, necessary to utilize an electrically conductive diffusion barrier between the platinum and the polysilicon. Thus, claims 1 and 12 clearly calls for a process for forming a barrier film comprising depositing a titanium layer on an upper surface of a plug, depositing a layer of amorphous material on the titanium layer and depositing a titanium nitride layer the said amorphous material layer.

Furthermore, the Huang reference fails to teach these such limitations to establish a *prima facie* case of obviousness under 35 U.S.C. § 103 regarding the presently claimed inventions. The Huang reference teaches placing metal in a well. It fails to teach all the steps of claim 1 which include depositing a titanium layer on an upper surface of a polysilicon plug, depositing a layer of amorphous material on the titanium layer and depositing a titanium nitride layer the said amorphous material layer. Additionally, the Huang reference fails to teach placing material on top of a plug.

Therefore, the combination of the Tsang reference and the Huang reference not only teaches away from the present invention, but they do not suggest the elements of the claims of the present invention to establish a *prima facie* case of obviousness under 35 U.S.C § 103.

Obviousness Rejection Based on Iranmanesh (U.S. Patent 5,514,900) in View of Tsang et al. (U.S. Patent 5,353,246)

Claims 1 and 12 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Iranmanesh (U.S. Patent 5,514,900) in view of Tsang et al. (U.S. Patent 5,353,246). Applicants respectfully traverse this rejection, as hereinafter set forth.

Again, Applicants assert that to establish a *prima facie* case of obviousness under 35 U.S.C. § 103 three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Third, the cited prior art reference must teach or suggest all of the claim limitations. Furthermore, the suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, and not based on Applicants' disclosure.

The Iranmanesh reference teaches or suggests an antifuse structure including a first interconnection line, a second interconnection line formed over the first interconnection line, and a plurality of programming layers between the first and second interconnection lines. In drawing FIGS. 4A through 4F a tungsten plug 48 is illustrated having having an inverted antifuse structure.

Applicants assert that there is no suggestion whatsoever in either the Iranmanesh reference or the Tsang reference or in the information available to one of ordinary skill in the art to modify the Iranmanesh reference in view of the Tsang reference to establish a *prima facie* case of obviousness under 35 U.S.C. § 103 regarding the claimed inventions of independent claims 1 and 12. Applicants further assert that even if the Iranmanesh reference is modified based upon any teaching or suggestion of Tsang the result be merely be the tungsten plug 48 would be modified to be a word line of polysilicon. Such is not the presently claimed inventions of independent claims 1 and 12.

Further, Applicants assert that any combination of the cited prior art fails to teach or suggest all the claim limitations of the presently claimed inventions of independent claims 1 and 12 to establish a *prima facie* case of obviousness under 35 U.S.C. § 103 regarding the claimed inventions of independent claims 1 and 12. For instance, Applicants assert that any combination of the cited prior art fails to teach or suggest the claim limitations of independent claims 1 and 12 calling for “providing a polysilicon plug having a surface in a portion of a dielectric layer of a portion of an integrated circuit”, “depositing a layer of titanium on at least a portion of the surface of the polysilicon plug”, “depositing a layer of amorphous material on at least a portion of the layer of titanium”, and “depositing a layer of titanium nitride on at least a portion of the layer of amorphous material”.

In contrast to the presently claimed inventions of independent claims 1 and 12, any combination of the cited prior art fails to teach or suggest the use of a polysilicon plug at any time. Only and solely the Applicants’ disclosure teaches or suggests the use of such a plug.

Therefore, independent claims 1 and 12 as well as the dependent claims therefrom are allowable.

Obviousness Rejection Based on Iranmanesh (U.S. Patent 5,514,900) in View of Tsang et al. (U.S. Patent 5,353,246) and Further in View of Katz (U.S. Patent 5,098,438)

Claims 3 through 6, 9, 11, 14 through 17, 20, and 22 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Iranmanesh (U.S. Patent 5,514,900) in view of Tsang et al. (U.S. Patent 5,353,246), as applied above, and further in view of Katz (U.S. Patent 5,089,438). Applicants respectfully traverse this rejection, as hereinafter set forth.

Applicants assert that dependent claims 3 through 6, 9, 11, 14 through 17, 20, and 22 are allowable as depending from allowable independent claims 1 and 12.

Obviousness Rejection Based on Sandhu et al. (U.S. Patent 5,381,302) in View of Sandhu et al. (U.S. Patent 6,107,105)

Claims 1, 2, 7 through 9, 12, 13, and 18 through 20 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Sandhu et al. (U.S. Patent 5,381,302) in view of Sandhu et al. (U.S. Patent 6,107,105). Applicants respectfully traverse this rejection, as hereinafter set forth.

Applicants submit that neither Sandhu et al. reference is available for use in any rejection under 35 U.S.C § 103 as such patents are commonly owned by Micron Technology, Inc., the owner and assignee of the present patent application.

Obviousness Rejection Based on Sandhu et al. (U.S. Patent 6,107,105) and Further in View of Sandhu et al. (U.S. Patent 5,571,572)

Claims 3 through 6, 14 through 17, 10, 11, 21, and 22 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Sandhu et al. (U.S. Patent 6,107,105), as applied to claims 1, 2, 7 through 9, 12, 13, and 18 through 20 above, and further in view of Sandhu et al. (U.S. Patent 5,571,572). Applicants respectfully traverse this rejection, as hereinafter set forth.

Applicants submit that neither Sandhu et al. reference is available for use in any rejection under 35 U.S.C § 103 as such patents are commonly owned by Micron Technology, Inc., the owner and assignee of the present patent application.

Applicants further submit that to establish a *prima facie* case of obviousness under 35 U.S.C. § 103 three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Third, the cited prior art reference must teach or suggest all of the claim limitations. Furthermore, the suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, and not based on Applicants' disclosure.

Double Patenting Rejection Based on U.S. Patent 6,313,031

Claims 1 through 22 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1 through 6, 8, 9, 11, 10, and 7, respectively, of U.S. Patent 6,313,031. In order to avoid further expenses and time delay, Applicants elect to expedite the prosecution of the present application by filing a terminal disclaimer to obviate the double patenting rejections in compliance with 37 C.F.R. §1.321 (b) and (c). Applicants' filing of the terminal disclaimer should not be construed as acquiescence of the Examiner's double patenting or obviousness-type double patenting rejection. Attached is the terminal disclaimer and accompanying fee.

Double Patenting Rejection Based on U.S. Patent 6,093,615

Claims 1 through 20 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1 and 4 of U.S. Patent 6,093,615. In order to avoid further expenses and time delay, Applicants elect to expedite the prosecution of the present application by filing a terminal disclaimer to obviate the double patenting rejections in compliance with 37 C.F.R. §1.321 (b) and (c). Applicants' filing of the terminal disclaimer should not be construed as acquiescence of the Examiner's double patenting or obviousness-type double patenting rejection. Attached is the terminal disclaimer and accompanying fee.

Applicants submit that claims 1 through 22 are clearly allowable over the cited prior art.

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Applicants request the allowance of claims 1 through 22 and the case passed for issue.

Respectfully submitted,

A handwritten signature in black ink, appearing to read "James R. Duzan". The signature is fluid and cursive, with a long, sweeping tail on the final letter.

James R. Duzan

Registration No. 28,393

Attorney for Applicant(s)

TRASKBRITT

P.O. Box 2550

Salt Lake City, Utah 84110-2550

Telephone: 801-532-1922

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JRD/ps:dh

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